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THE SCIENCE NEWS-LETTER

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ANCIENT MAYAS STUDIED EARTHQUAKES; SOUGHT LAND FREE FROM THEM FOR HOME

Definite proof that the ancient Maya civilization of Yucatan and adjacent regions of Central America originated in an archaic pre-Toltec culture in the Valley of Mexico, is claimed by Dr. Manuel Gamio, who recently returned from an expedition into the highlands of Guatemala, Dr. Gamio, who is one of the foremost archeologists of Mexico and former head of the Mexican Department of Anthropology, was sent into the field by the Archeological Society of Washington.

In a series of excavations in the high plateau region of Guatemala, particularly in the vicinity of the cities of Quiche, Huehuetenango and Quetzaltenango, Dr. Gamio uncovered pottery so similar to the oldest recognized type of similar material of Mexico as to be identical. This type has been found in city ruins underlying an ancient lava flow considered by geologists to be not less than four thousand years old. It has been unearthed especially under the Pedregal lava in the vicinity of Cuicuilco, Valley of Mexico.

Pottery of this type is called the Archaic because it predates and was the origin not only of the Aztec type, but also of the Toltec, which is considered older than the latter, and is supposed to be the oldest grade of culture higher than the neolithic, or stone age development of the North American Indian.

Basing his premise on the generally accepted theory of an Asiatic origin of the American Indian, Dr. Gamio declares the red man did not develop a higher culture until he had migrated, during many years, far to the south. The pueblo culture of the southwestern States was a step in this progress, he believes, though many of the pueblo people remained where their ruins are now found and did not develop much further. Not until the tide of immigration reached Mexico was the stage of culture very high. The route of immigration, according to his theory, was down the Mexican highlands into the mountains and plateaus of what is now Guatemala, thence eastward toward Yucatan and then throughout the peninsula where aboriginal American civilization attained its peak.

From the similarity of forms found in Guatemala, Dr. Gamio presents the theory that some of the Archaic people abandoned central Mexico in search of a region free from earthquakes and volcanic disturbances, such as demolished their more northern cities or buried them under many feet of lava and volcanic dust. He also believes that the Maya and similar cultures are not found south of Guatemala and Honduras because the migrating people found themselves approaching a land of still worse

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volcanoes and more frequent earthquakes. That no building ruins are found in seismic regions is believed by the Mexican acientist to be proof that the Mayas purposely never built their great buildings where they knew earthquakes would endanger them.

Having slowly developed to the stage of building in stone, this ancient people moved toward Yucatan and finally to its northern extremity, he declares. Yucatan is free from volcanic and earthquake movements and therefore, Dr. Gamio believes, not only did the ancients migrate there for that reason after a period of development in Guatemala, but their engineering and architectural art was able to reach its high state because of that freedom.

Dr. Gamio also unearthed primitive stone monuments, some plain, some lightly carved, which indicate to him that the ancients, having come from a section where such stelas are not found, developed this art first in Guatemala. The intricately carved stelas or columns of the ruined cities of Yucatan, generally bearing human statues in relief, were an important branch of Maya art. The form and treatment of the early Guatemala stelas, both plain and carved, clearly show they were the first of these monuments, Dr. Gamio claims. The Archaic art of the Valley of Mexico and the finished style of the Mayas are plainly connected through the Archaic of Guatemala, he asserts.

Dr. Gamio's expedition was to decide two theories he had long advocated: that of the migration of the ancestors of the Mayas from central Mexico into Yucatan via Guatemala and the direct connection of the two cultures, and that the Mayas were students of seismic and volcanic action and studiously avoided building stone cities in earthquake sections. He also wished to demonstrate that malaria, which it has been declared was introduced into the New World from the Old, possibly of an Italian origin, existed in the Americas in olden times. He states that he found no malaria in the high regions, but other proof existed of the occurrence here of malaria, and that the Indians have, in the course of untold centuries, become to a great extent immune.

Dr. Gamio published the report of his findings in the Society's journal and also announced a totally new theory bearing on the stratigraphical occurrence of the several archeological types. He divides the cultures into the Classical Archaic, Neo-Archaic, Transitional and developed Maya.

NEW TREATMENT FOR CANCER USES EXTRACT OF LIVER

Liver extract is the latest addition to the long list of weapons with which medical science seeks to stem the rising cancer death rate.

The work with liver extract, which in the United States has been used with some success in treating high blood pressures, was initiated by Dr. John R. Howitt of the medical school at the University of Western Ontario. He based his theory on the fact that since the liver is disproportionately large during embryonic life, when it does not secrete bile, it must have some other function. Its relatively large size suggested that it might exercise some influence on the extraordinary growth that the human body undergoes during the embryonic period. As cancer is a manifestation of abnormal cellular growth, Dr. Howitt decided that the effect of the active principle

of liver on such a growth would be worth trying.

In his first experiments he injected extracts from the livers of pig embryos into cancerous mice. The results were so encouraging that liver extracts, this time from beef, were tried on hopeless cases of human cancer too far gone for operation.

"In one patient there was a complete disappearance of the tumor mass," says Dr. Howitt in a report of his results to the scientific journal, Nature, "in others still under treatment a reduction in the size of the growth has been noted. In every case the progress of the disease has been arrested and the life of the patient prolonged beyond that of the prognosis given before the treatment commenced. No. radical claims are advanced for this treatment, but the results obtained clinically have warranted a more extensive investigation which is now being carried out at the University of Western Ontario, London, Ont., and the McGregor-Mowbray Clinic at Hamilton."

Though the advance is slow, the concentrated forces of scientific research are closing in on modern humanity's most dreaded plague. The lead treatment of Prof. Blair Bell of Liverpool has likewise made considerable progress in the last few months, it is announced. Sufficient improvement has been made in the form of lead used by Prof. Bell to warrant its being put on the market in both England and the United States in the near future, according to latest reports from his laboratory at the University of Liverpool. Formerly the great drawback of the method was due to the fact that the particular preparation of lead that gave the best results was so unstable that its curative properties would only last a short time.

A limited number of physicians who wish to take up this work will be trained by Prof. Bell in the technique of administering colloidal lead, so that this new treatment will now become available to greater numbers of sufferers. In spite of its improvement, however, on account of the poisonous character of all lead compounds, only cases on which all usual methods are powerless will be accepted for treatment.

GRASS CLOTH MAY RIVAL COTTON GOODS

The secret of turning tropical grasses and other fibrous substances into clothes to wear is believed to have been solved by Dr. Dinshaw Nanji of Birmingham University. Chemical processes are said to have been perfected for separating the fibers from the raw materials and preparing them for spinning. The fabrics, if commercially successful, may take the place of cotton in the regions where large supplies of grasses are available. It is thought that new and interesting materials may be developed for wearing apparel and other uses.

NEW ALLOY NEEDED FOR GIANT TELESCOPE

A super-telescope 25 feet in diameter, dwarfing all other existing astronomical instruments and making possible scientific discoveries of far-reaching importance is perfectly feasible, if only $12,000,000 or so were forthcoming to make it. Francis G. Pease of the Mount Wilson Obervatory describes in detail this hypothetical astronomical giant in an article published in the Proceedings of the Astronomical Society of the Pacific.

Such a huge instrument would of necessity be a reflector, in which a concave mirror replaces the convex lens of the small spy-glass. While the mechanical problems of such an instrument would be relatively easy to solve, says Mr. Pease, there is at present no ideal material from which the mirror could be made.

The big 100 inch telescope at Mount Wilson, the largest in the world at present, in the design and construction of which Mr. Pease had an important part, has a mirror of glass, on the upper surface of which is a coating of silver. The making of a glass mirror 25 feet in diameter possesses no more inherent difficulties than did the construction of the 100 inch, he believes, but glass has certain disadvantages, such as change in shape with variations in temperature, and tarnishing of the silver coating. Astronomers therefore look forward, says Mr. Pease, to a material such as a hypothetical alloy, which he calls "Mirrorite". Mirrorite, when made into a mirror, should reflect light as well as silver, should be free from tarnish like the stainless steel now often used in cutlery, should not change appreciably with the temperature, a property now possessed by a steel alloy known as invar, and should be as light as magnalium, an aluminum-magnesium alloy which has already been used for some smaller telescope mirrors.

Mr. Pease believes that the hope for such a substance is no idle dream. "There is a promising field for research in the investigation of metal alloys suitable for mirrors." he states. "When one considers the enormous number of possible combinations of metals, it should be possible to find an alloy which would be light in weight, which could be cast either solid or as a ribbed plate, and which could be easily silvered, if not in itself possessing excellent permanent reflecting properties.

"Alloys are now known which possess some of these desirable properties, and it may be that the addition of other metals, or new combinations of them would yield the desired material."

If the money that a telescope with a 25 foot mirror would cost were available, it might not be necessary to wait for the discovery of "mirrorite" to make it, Mr. Pease believes. A reasonably satisfactory substance would be found in glass containing a large percentage of quartz. The telescope would be of the "Cassegrain" type, in which the light from the big mirror is reflected back to a smaller one, and then back again through a hole in the big one to the observer. The hole in a 25 foot mirror would be at least seven feet in diameter, says Mr. Pease, and so the strains due to changes with temperature would be less than in a solid disc. Such an instrument would require excellent atmospheric conditions for its most efficient use, but Mr. Pease states that his experience leads him to believe that it could be used at Mount Wilson to the same excellent advantage as the 100 inch.

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A NEW METHOD FOR MAKING A TELESCOPE MIRROR

CHEMISTS WORK ON IDEAL FUEL FROM COAL

The scientific world is at work on a new fuel from coal which will be smokeless and almost wasteless, for it is expected to save a large portion of the three-fourths ton of coal that now goes up the chimney for every ton burned in the ordinary way. At a recent meeting of the American Chemical Society chemists from all over the United States discussed the pros and cons of "semi-coke", the proposed new fuel.

The difficulties in the way are more economic than scientific. "Semi-coke" is to be made by a low temperature process which requires entirely different apparatus from that used in making ordinary coke in by-product ovens. The by-products of semi-coke are different from those of common coke and their economic value has not been established. In fact, it presents an entirely new group of materials for chemists to learn how to utilize.

In the old coke making process the four primary products recovered, gas, tar, ammonia and light oils, are raw materials in the manufacture of explosives, fertilizers, dyes, and chemicals used in American factories. The coke is used mainly in the making of steel. A small amount is used for domestic fuels, especially during war emergencies and coal strikes, but the housewife thinks it is a poor product to burn in the kitchen range.

The new semi-coke, because it is heated at a low temperature, retains many of the higher oils and other combustible substances. It is smokeless and said to burn as easily as coal and much more readily than finished coke. The gases, oils and ammonia that are lost in smoke when coal is burned are recovered. Semi-coke is therefore hailed by many scientists as the solution for a world problem.

With the world coal supply going down and the cost of production, labor and transportation going up, every coal-using country is trying to use coal less and get more out of it. Great Britain hopes to get fuel oil for her navy from the part of the domestically burned coal that is now wasted. In England as in the United States it is a question of what to do with the by-products of semi-coke, and how they can be made to pay. The new method yields more tar, but it is thin and oily and unlike the well-known coal tar. The yields of gas and ammonia are less, but the gas is much richer and higher in fuel value.

"Making semi-coke by low temperature carbonization of coal retains all its initial interest," said Prof. S. W. Parr of the University of Illinois, chairman of the division of gas and fuel chemistry of the American Chemical Society meeting, "in spite of the preponderating element of adverse circumstances from the industrial viewpoint, such as costs of installation, operating expense and the undetermined value of the by-products, especially tar and ammonia."

The properties of these new by-products are already being studied by chemists. Sumner R. Church of New York City who has studied the by-products of low temperature carbonization of Illinois coal found that satisfactory oils and pitches were obtained by refining the new tar in the old way.

"The new tars possess to a surprising degree the characteristics of the most desirable types of high temperature tar," Mr. Church said. "An important feature of the new tars is their content of tar acids, falling between phenol and cresols in boiling range."

The strong red color of tar liquor and disinfectant emulsions made from low temperature tar oils, the cause of which has puzzled chemists, has handicapped the marketing of low temperature tar, Stephen P. Burke and Solomon Caplan of Long Island City told members of the American Chemical Society. They explained that the objectionable color could now be extracted by means of a borax solution.

The amount of heat necessary to carbonize various types of coal at the comparatively low temperature of 1100 degrees Fahrenheit has been measured by Stephen P. Burke and V. F. Parry of Long Island City. They found that Pittsburgh coal required only 7 British thermal units of heat energy while Utah non-coking coal took 37 and Denver sub-bituminous coal 81 units.

DYESTUFFS USED TO MAKE BETTER RUBBER

Dyes and other organic compounds are now being used for prolonging the life of rubber as well as for speeding up the vulcanizing process in making the finished product from the sticky crude plantation rubber. Donald H. Powers of Pennsgrove, N.J., described how the dyestuffs industry is thus helping the rubber manufacturer, at the meeting of the American Chemical Society at Philadelphia.

"Organic compounds have been used as accelerators in vulcanizing rubber for the past ten years," Mr. Powers said, "but the dye industry is now furnishing some of most widely used ones as well as developing newer and better ones. In addition, an organic anti-oxidant, a substance that slows up the aging of rubber, has been developed."

The world rubber situation will be profoundly affected when the secret of keeping rubber "alive" is solved. Rubber deteriorates fast on exposure to sunlight and under nearly all conditions to a varying extent. Chemists have been trying for years to find some substance with which to "dopo" the rubber and keep it from aging too fast. A new substance put on the market by the dyestuffs industry, Mr. Powers said, is already prolonging the life of rubber manyfold.

Before the use of organic dyestuffs in rubber products only a few inorganic colors were available, Mr. Powers said. But now a wide variety of shades is used producing stocks of superior products, and the dyestuffs industry is busy searching for new and still better compounds for use in rubber manufacturing.

NEW GLAND EXTRACT NOW MADE FOR COMMERCIAL USE

An extract of the parathyroid gland, a small ductless organ back of the thyroid gland in the neck, which controls the lime content of the blood, may soon be on the medicine shelf. A.M.Hjort and H.B.North of Detroit reported their successful preparation of this hormone from animal glands to the American Chemical Society which met recently at Philadelphia. The active substance that does the work is believed to be a protein.

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The strong red color of [illegible] is due to [illegible] compounds. [illegible] temperature for [illegible] which [illegible] and [illegible] has been [illegible] city told [illegible] of [illegible] and [illegible] of [illegible] color [illegible] by [illegible] solution.

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EXTRACTS FROM BRAIN TISSUES STOP BLEEDING

Dangerous bleeding after surgical or accidental injury to blood vessels may now be stopped by chemical substances derived from brain, lung, blood, or other body tissues. Herbert Hamilton of Detroit described at the recent meeting of the American Chemical Society at Philadelphia how substances of animal origin which cause the blood to coagulate more quickly are made. Extracts may be prepared from any tissues, Mr. Hamilton said, but those from the brains or lungs are the most effective. These substances are to be used by "bleeders", or hemophiliacs, as the doctors call them. They are persons with blood which fails to coagulate quickly enough or which does not form the right kind of clots.

BEST FOOD DYES MADE IN AMERICA

How American chemists had to get busy to maintain the pretty pre-war colors of domestic candies and cake icings with home made dyes during the World War and afterwards, was described at the recent meeting of the American Chemical Society at Philadelphia by W. C. Bainbridge of Brooklyn, N. Y. From 1907 to 1914 food colors were purified from imported crude dyes from Germany but after that time American manufacturers had to produce their own from domestic raw materials, Mr. Bainbridge said.

"The use of coloring matter in foodstuffs is an old established practice which originated in the workshop of Nature," Mr. Bainbridge explained. "Man in his endeavor to meet the culinary requirements of advancing civilization found it necessary to perpetuate the familiar and characteristic hues that suffered no deterioration in the process of cooking or preserving. Thus the art of tinting foodstuffs was established.

"At first the juices of such vegetables or fruits that lent themselves readily to extraction and concentration were employed," Mr. Bainbridge said, "Those coloring matters were as a rule easily destroyed and the results were not satisfactory. But the advent of coal tar colors brought the desired permanent shades and hues and these soon found wide use. In 1907 the U.S.Government passed a law making the use of certain of the harmless coal tar colors in food permissible and barring the rest."

The war established a new industry in the United States and a larger variety of truly superior dyes are now being produced here as a result, it is said.

FEMALE SEX GLAND EXTRACT STUDIED

The chemical substance that controls sexual reactions in the female and which was recently first isolated from the ovarian gland has been subjected to many laboratory tests since its discovery and many of the properties and effects of this vital substance have been studied. J. O. Ralls, C.N.Jordan and E.A. Doisy of the St. Louis School of Medicine have succeeded in making a highly pure preparation of the hormone free from cholesterol, a substance present in all body tissues, they told members of the American Chemical Society at its recent meeting.

A chemical analysis of the purified substance showed that it contains carbon, hydrogen, nitrogen, phosphorus and oxygen. As oxidation destroys the power of the extract, a study was made to see whether anti-oxidizing agents would enhance its keeping qualities.

BONE MARROW IS GOOD BLOOD TONIC

The snarling, bone-splitting, marrow-sucking caveman who ate things that modern man's nostrils curl at was at least not anemic. Chauncey Leake of the University of Wisconsin has made a preparation of red bone marrow and dried spleen which he says is an excellent tonic for making good red blood for weak people. His preparation is to be taken by the mouth, Mr. Leake explained to members of the American Chemical Society meeting a few days ago. It does not deteriorate on standing and has no untoward side effect on the patient.

Tests showed, Mr. Leake said, that dried spleen and bone marrow each stimulate red blood cell production but they are most active when they are taken together. When combined in fifty-fifty portions the mixture contains about one-fourth of one per cent. of water-soluble iron. The beneficial properties of the mixture are not destroyed when heated as hot as boiling water.

CHEMIST MAKES NEW SYNTHETIC RESIN

A new resin, made of glycerine and carbolic acid, and used in the making of varnishes, molding powder and other substances, was described before the American Chemical Society meeting recently by James McIntosh, of Bridgeport, Pa., the discoverer. After the glycerine and carbolic acid have been condensed the product can be made into an infusible insoluble substance by a one or two step process. The reaction can be speeded up by the addition of a hardening agent. The new resin is called acrolite.

WOOD AND WEATHER AFFECT WEARING QUALITIES OF PAINTS

Why a coat of paint stays longer on one barn than another or wears better in one place than another has been studied by scientists of the Forest Products Laboratory and other organizations. Frederick L. Browne and Clarence E. Hrubesky, of Madison Wis., told members of the American Chemical Society of paint test on fences erected in eleven different places in the United States representing widely varying climatic conditions, eighteen varieties of softwood lumber, and two types of paint.

In the cases of some of the woods both types of paint have survived two years of exposure perfectly, while in other cases one or both kinds of paint failed badly. Some of the fences made of southern yellow pine failed very early, whereas cypress fences did very well in spite of the fact that the wood has a reputation of being a "bad painter". The durability of paint was much greater on edge grain than on flat grain lumber of certain species. Weather conditions have a great effect on paints and caused complete failure in many cases.

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WANTS GLASS INDUSTRY TO BE ARTISTIC

The American glass industry has increased manifold in the value of its output and the amount of capital invested, and has developed many new ways of making modern types of glass apparatus on the market. Art, however, should not be left out, in the opinion of Prof. Alexander Silverman of the University of Pittsburgh, who described the history of fifty years of glass making to the scientists at the meeting of the American Chemical Society. The plate glass of shop windows is now made by a new continuous rolling process, Prof. Silverman said, and bottles and electrical bulbs are made by machine. Much study has been devoted to the making of bullet-proof glass. New colors are being produced by the chemical element selenium and other materials in glass tableware.

NEW TEXAS POTASH MAY SOLVE FERTILIZER PROBLEMS

The potash fields recently discovered in Texas are now believed comparable with the famous German ones which before the war supplied the world with potash. Dr. John W. Turrentine, in charge of potash investigation in the U.S. Bureau of Soils, at the meeting of the American Chemical Society recently, said that there was ground for hope that a potash industry of national importance may be developed here. Incomplete data so far available fail to reveal a workable deposit, Dr. Turrentine said, but amply justify the thorough exploration of this field.

The isolation of the Texas potash fields is a severe drawback to their commercial development, but it can be overcome, Dr. Turrentine believes, by a system of pipelines for the transportation of the concentrated brines from the mines to the nearest seaports. At these places the solution could be chemically refined and shipped by water routes to markets of the southern and middle western states.

The potash salts discovered in the Texas fields could be used for fertilizer without refining, but the low concentration, it is believed, would prohibit its transportation by rail to any great distances. However it might be used without refining in the southwest where no supplies of cheap potash are now available. These salts could be easily converted into rich potash compounds by simple chemical treatment which would reduce transportation costs and enable them to compete with the cheap Franco-German potash on the market today, Dr. Turrentine said. Potash recovery, which was formerly a mining industry, is now essentially chemical, through the need of making the final product richer and thereby cutting transportation costs. The Texas potash industry, he believes, will be no exception, and its success will depend on the ingenuity of the chemist.

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WASTE GLASS INDUSTRY TO BE ARTISTIC

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IODINE FROM SEAWEED MAKES EXCELLENT MEDICINE

The iodine that is found in certain marine plants is 200 times as effective as inorganic iodides in its power to bring the thyroid gland back to normal, Dr. J.W. Turrentine of the U. S. Bureau of Soils, who told of his researches at the recent meeting of the American Chemical Society at Philadelphia, said that small doses of iodine-bearing substances coming from seaweed cured simple goiter. The symptons of iodism that often result from using inorganic iodides were lacking and there were no disturbances such as result from taking thyroid gland preparations.

It appears that the iodine is present in a colloidal form in the marine plants and is absorbed very slowly by the digestive tract. This lessens the chance of over-dosing, Dr. Turrentine said. He believes that the use of iodine in this form in the treatment of thyroid disturbances should be generally tried by physicians.

AMERICAN FUR DYEING INDUSTRY LEADS WORLD

America not only dyes her own fur collar now, but does it better perhaps than any other country in the world, William E. Austin told the recent meeting of the American Chemical Society at Philadelphia. Before the war nine-tenths of all the colored furs used in the country were dyed in Europe and those that were not, were colored with German coal tar dyes. Today, however, America tints her own and uses colors she makes herself.

About forty different dyes are used here now as compared with six about ten years ago. Every color in the rainbow scale is represented, Mr. Austin said, and novel effects in applying coloring matters are being developed. American chemists and engineers have succeeded in putting the American fur dyeing industry on the map, so that today it leads the world in efficiency, modern organization and progressive ideas.

VITAMIN FEEDING MAKES BETTER CHICKENS

Hens given vitamin A in addition to their regular diet not only hatch more chicks but are healthier themselves and lay bigger and better eggs. Dr. Arthur D. Holmes of Boston told of the effect of feeding vitamin-rich cod liver oil to domestic fowl, at a recent meeting of the American Chemical Society at Philadelphia.

Rhode Island Red pullets were given doses of cod liver oil each day and as a result Dr. Holmes found that they laid more eggs. The eggs themselves were larger than usual and their fertility was greater. Fewer eggs contained objectionable blood spots. The greater number and size of the eggs did not make nervous wrecks of the laying hens. On the contrary they showed increased vitality and did not lose weight during the tests. They had a greater resistance to diseases, for fewer of the vitamin-fed ones died than the ones who lived on the normal hen diet alone.